INDEX TO VOLUME XLII.*

A

Academy, National, meeting at New York, 523.
Aerodynamics, experiments in, Langley, 427.
Alabama, geological survey, 515.
Alaska, expedition to, Russell, 171.
American Geological Society, Washington meeting, 77.
Arkansas, geol. report, Branner, 347.
Association, American, president's address, 271.
Washington meeting, 353.
British, 358.

B

Bailey, E. H. S., Tonganoxie meteorite, 385.
Baker, E. P., volcano of Kilauea, 77.
Barker, G. F., chemical abstracts, 66, 169, 256, 339, 422, 509.
Barometer, mercurial, Waggener, 387.
Barus, C., continuity of solid and liquid, 125; contraction of molten rock. 498; solution of vulcanized india rubber, 359.
Beecher, C. E., development of Bilobites, 51.
Bibliotheca Zoologica, Taschenberg, 438.
Bigelow, F. H., solar corona, 1; causes of variations of the magnetic needle, 253.
Blair, Chemical analysis of iron, 428.
Botany—
Annual plants, vitality, Holm, 304.
Botanic gardens in the equatorial belt and South seas, Goodale, 173, 260, 347, 434, 517.
Botany, economic possibilities of, Goodale, 271.
Brackett, R. N., newtonite and rectorite, 11.
Branner, geol. report of Arkansas, 347.

C

Call, R. E., silicified woods of eastern Arkansas, 394.
Cape Cod, sea-encroachment at, Marindin, 172.
Cary, A., geological facts on Grand river, Labrador, 419, 516.
Chemistry, Dictionary of applied, Thorpe, 341.
Inorganic, system of, Ramsay, 510.
Organic, Richter, 509.
Chemistry—
Alkaloid from Conium maculatum, Ladenburg and Adam, 423.
Allotropic silver, Lea, 312.
Aluminum, electro-metallurgy, Minet, 67.
Antimony, determination, Gooch and Gruener, 213.
and arsenic separated, Gooch and Danner, 308.
Battery, secondary, chemistry of, Cantor, 169.
Black sulphur of Magnus, Knapp, 422.
Boron tri-iodide, Moissan, 256.
Carbon compounds, chemistry of, von Richter, 509.
monoxide, action of heat on, Berthelot, 67; new reaction, 170.
Chemical and electrical energy in voltaic cells, Levay, 66.
reactions, dead space in, Liebreich, 170.
Chlorates, estimation, Gooch and Smith, 220.
Hydrazine hydrate, Curtius and Schulz, 257.
Indigo-carmine, synthesis of, Heymann, 257.
Iron- and nickel-tetracarbonyl, Mond and Quincke, 424.
Mercury, detection in cases of poisoning, Lecco, 68.
Oxygen, spectrum of liquid, Olszewski, 338.
Ozone produced by rapid combustion, Ilosvay, 339.
Potassium determined spectroscopically, Gooch and Hart, 448.
Silicon, new form, Warren, 423.
Sulphur, new modifications, Engel, 509.
Sulphuryl peroxide, Traube, 340.
Tartaric acid, sensitive reaction for, Mohler, 425.
Tetrazotic acid and derivatives, Lossen, 68.
Titanic acid in soils, Dunnington, 491.
Clarke, F. W., constitution of certain micas, vermiculites and chlorites, 242.

* This Index contains the general heads BOTANY, CHEMISTRY, GEOLOGY, MINERALS, OBITUARY, and under each the titles of Articles referring thereto are mentioned.

Color photography, see *photography*.
Comets, capture of, by planets, Newton, 183, 482.
Comstock, G. C., secular variation of latitudes, 470.
Corona, solar, Bigelow, 1.
Crosby, W. G., composition of till or bowlder clay, 259.
Cutter, E, phonics of auditoriums, 468.

D

Dale, T. W., the Greylock synclinorium, 347.
Dana, J. D., non-volcanic igneous ejections and the Four Rocks of New Haven, 79; Percival's map of the trap-belts of central Connecticut, and the upturning of the sandstone, 439.
Danner, E. W., separation of antimony from arsenic, 308.
Davis, W. M., fossiliferous black shale of Connecticut, 72.
Davison, C., earthquakes in Great Britain in 1889, 512.
Davison, J. M., kamacite, tænite and plessite, analyses, 64.
Dawson, G. M., geology of the Rocky Mountain region in Canada, 259.
Denning, W. F., Telescopic work for starlight evenings, 178.
Denudation in the Egyptian desert, Walther, 177.
Ditt, A., Leçons sur les Métaux, 258.
Dumble, E. T., geol. survey of Texas, 430.
Dunnington, F. P., titanic acid in soils, etc., 491.

E

Eakins, L. G., astrophyllite and tscheffkinite, 34.
Earthquakes in Great Britain, 1889, Davison, 512.
Edwards, A. M., infusorial earths of the Pacific coast, 369.
Egleston, T., Catalogue of minerals and synonyms, 434.
Electrical oscillations, damping of, Bjerknes, 511.
on iron wires, Trowbridge, 223.
waves, velocity, Avons and Rubens, 511.
Electricity, chapters on, Sheldon, 511.
discharge through exhausted tubes, Thomson, 426.
and magnetism, mathematical theory, Emtage, 510.
Electrochemical equivalent of copper, Vanni, 511.
Electrolytic generation of gas, Chabry, 511.
Electromagnetic units, ratio of to electrostatic, Thomson and Searle, 427.
Electrometers, small, Boys, 342.
Emtage, W. T. H., Mathematical theory of electricity and magnetism, 510.

F

Ferrier, W. F., tungsten minerals in Canada, 347.
Flying machine, Maxim's, 342.
Foote, A. E, meteoric iron of Cañon Diablo, 413.
Foshay, P. M., glacier scratches in western Pennsylvania, 172.
Fossil, see *Geology*.
Frazer, R., Tables for the determination of minerals, 77.
Fremy, E., Synthese du Rubis, 432.

G

Gas, electrolytic generation of, Chabry, 511.
Geikie, A., history of volcanic action in the British Isles, 178.
Geological annual, 1889, Carez and Douvillé, 76.
Geological Reports and Surveys—
Alabama, Smith, 515.
Arkansas, 1888, Branner, 347.
Georgia, 1890, 1891, 515.
Missouri, Bulletin, No. 5, 515.
New Jersey, 1890, Smock, 70.
Texas, Dumble, 430.
Geological Society of America, meeting at Washington, 77, 344.
Geologists, international congress, meeting at Washington, 78, 343.
U. S. Association of Government, 344.
Geology—
Archæan limestone of N. Jersey, 70.
rocks of Missouri, origin of, Haworth, 515.
Asphaltum of Utah and Colorado, Stone, 148.
Bilobites, development of, Beecher, 51.
Cambrian, lower, fauna of, Walcott, 345.
St. John group, No. 2, fauna of, Matthew, 73.
rock-disintegration as related to transitional crystalline schists, Pumpelly, 346.
Carboniferous in France, flora of, Zeiller, 75.
Contact-metamorphism, formation of graphite in, 514.
Fossil insects of the world, index to known, Scudder, 516.
Glacial Lake Agassiz in Manitoba, Upham, 429.

GEOLOGY—
Glacier clays and till near Boston, Crosby, 259.
scratches in Pennsylvania, Foshay and Hice, 172.
Grand River, Labrador, Cary, 419, 516.
Greenstone schist in Michigan, Williams, 259.
Greylock synclinorium, Dale, 347.
Iron-ores, genesis, Kimball, 231.
Jura-Trias, see *Triassic*.
Mount St. Elias, Russell, 171.
Ouachita Mt. system, Hill, 111.
Peridotite dikes near Ithaca, N. Y., Kemp, 410.
Permian coal plants, Zeiller, 75.
Pleistocene fluvial planes of Pennsylvania, Leverett, 200.
Rocky Mt. region in Canada, Dawson, 259.
Silurian sandstone of Keweenaw Pt., Wadsworth, 170.
Sphenophyllum, Newberry, 76.
Spherulites in rhyolite, Iddings and Penfield, 39.
Steep Rock Lake, Ont., geology, Smyth, 317.
Stegosaurus, restoration of, Marsh, 179.
Tertiary, pre-pleistocene age of the orange sands, Salisbury, 252.
silicified wood of Arkansas, Call, 394.
Trap range of the Keweenawan series, Wadsworth, 417.
Triassic fossiliferous black shale of Connecticut, Davis and Loper, 72.
trap rocks of Connecticut, Davis and Loper, 72.
of New Haven, Dana, 79.
Percival's map of, and on the mountain-making, Dana, 439.
Vertebrate fossils as a criterion of age, Marsh, 336.
Volcanic, see *Volcanic*.
Water of a salt lake on Oahu, anal., 522.

Georgia, geological survey for 1890, 1891, 515.
Glacier, see *Geology*.
Gooch, F. A., determination of antimony, 213; the determination of potassium spectroscopically, 448; estimation of chlorates, 220; separation of antimony from arsenic, 308.
Goodale, G. L., botanic gardens in the equatorial belt and south seas, 173, 260, 347, 434, 517; possibilities of economic botany, 271.
Gruener, H. W., determination of antimony, 213.

H

Hale, G. E., photographic investigation of solar prominences, 160; the ultra-violet spectrum of the solar prominences, 459.
Harrington, J. B., so-called amber of Cedar Lake, Canada, 332.
Hart, T. S., potassium determined and detected spectroscopically, 448.
Hawaiian Islands, salt lake of Oahu, 522.
volcano of Kilauea, 77.
Haworth, E., origin of Archean rocks of Missouri, 515.
Hice, R. R., glacier scratches in western Pennsylvania, 172.
Hidden, W. E., new yttrium-silicate, rowlandite, 430.
Hill, R. T., Ouachita Mt. system, 111.
Hillebrand, W. F., new analyses of uraninite, 390.
Hoffman, G. C., ilvaite, 432.
Holm, T., vitality of some annual plants, 304.

I

Iddings, J. P., spherulites from Wyoming, 39.
India rubber, solution of, Barus, 359.
Indian Territory, geology, Hill, 111.
Interference of light, influence of brightness upon, Ebert, 342.
Infusorial earths of the Pacific coast, Edwards, 369.
Iron, Chemical analysis, Blair, 428.

K

Keller, H. F., Michigan minerals, 499.
Kemp, J. F., peridotite dikes near Ithaca, N. Y., 410.
Kilauea, volcano of, Baker, 77.
Kimball, J. P., genesis of iron ores, 231.
Kittredge, The Metal Worker, 523.
Kokscharow, N. v., Mineralogie Russlands, 77.

L

Labrador, geological notes on, Cary, 419, 516.
Lane, A. C., Michigan minerals, 499.
Langley, S. P., experiments in aerodynamics, 427.
Latitudes, secular variation of, Comstock, 470.
Lea, M. C., allotropic silver, 312.
Leidy memorial museum, 438.
Leverett, F., pleistocene fluvial planes of Pennsylvania, 200.
Light, reflection and refraction by their surface layers, Drude, 70.
Luedeking, C., Missouri barite, 495.
Lyons, A. B., analysis of water from the salt lake of Oahu, 522.

M

Magnetic declination in the U. S. for 1890, Schott, 178.
needle, causes of variations, Bigelow, 253.
Manganese ores in Arkansas, Penrose, 516.
Marindin, H. L., losses of Cape Cod by sea-encroachments, 172.
Marsh, O. C., restoration of Stegosaurus, 179; new vertebrate fossils, 265; geological horizons determined by vertebrate fossils, 336.
Matthew, G. F., fauna of the St. John group, 73.
Maxim's flying machine, 342.
Merrill, G. P., stones for building and decoration, 516.
Meteoric iron, analyses, Davison, 64.
Cañon Diablo, Foote, 413.
Tonganoxie, Bailey, 385.
Metal Worker, Kittredge, 523.
Mineralogie Russlands, Kokscharow, 77.
Minerals, catalogue, English, 438.
and synonyms, catalogue of, Egleston, 434.
Tables for the determination of, Frazer, 77.

MINERALS—
Amber, Cedar Lake, Canada, 332. Anatase, see *octahedrite*. Antlerite, Colorado, 434. Astrophyllite, Colorado, 34.
Barite, Missouri, 495. Bernardinite, California, 46. Biotite, N. C., 242. Brandtite, Sweden, 433.
Cassiterite, Mexico, 407. Cerussite, Arizona, 405. Chemawinite, Cedar Lake, Canada, 332. Chloritoid, Michigan, 499.
Ganophyllite, Sweden, 433. Gmelinite, Nova Scotia, 57. Graphite, formed in contact-metamorphism, 514. Grünerite, Michigan, 505. Gypsum, Girgenti, 407.
Hallite, Penn., 244. Hematite, Mexico, 407.
Ilvaite, Canada, 432. Iron, meteoric, 64.
Kallilite, Prussia, 433. Kamacite, 64. Kaolinite, Arkansas, 17.
Mordenite, axial ratio, 409. Muscovite, Maine, 251.
Newtonite, Arkansas, 13.
Octahedrite, Buckingham Co., Va., 431. Offrétite, France, 433. Orpiment, Yellowstone, 403.
Painterite, Penn., 247. Pennine, Texas, Pa., 408. Plessite, 64. Plumboferrite, Sweden, 434. Protovermiculite, Ark., 242. Pyrophanite, Sweden, 433.
Quartz crystals in spherulites, 42.
Realgar, Yellowstone, 403. Rectorite, Ark., 16. Riebeckite, Michigan, 508. Rowlandite, Texas, 430. Rubies, synthesis, Fremy, 432.
Sulphur, Yellowstone, 401. Sychnodymite, Prussia, 433.
Tænite, 64. Tscheffkinite, Virginia, 36. Tungsten minerals in Canada, 347.
Umangite, Argentine Republic, 433. Uraninite, new analyses, 390.
Missouri, geological survey, bulletin No. 5, 515.
Molten rock, contraction, Barus, 498.
Mount St. Elias, expedition to, Russell, 171.

N

Newberry, J. S., genus sphenophyllum, 76.
New Jersey, geological report, 1890, 70.
Newton, H. A., capture of comets by planets, 183, 482.

O

OBITUARY—
Ferrell, W., 358.
Joy, C. A., 78.
Williams, J. F., 524.
Organic dyes, optical relations of, Vogel, 342.
Organ pipes, energy used in, Wead, 21.
Ostwald's Klassiker der Exacten Wissenschaften, 178.

P

Peloponnesus, geology of, Philippson, 173.
Penfield, S. L., minerals in spherulites of rhyolite, 39.
Penrose, R. A. F., manganese ores in Arkansas, 516.
Philippson, A., geology of the Peloponnesus, 173.
Phonics of auditoriums, Cutter, 468.
Phosphorescence, Wiedemann, 69.
Photography of the spectrum in color, Vogel, 426.
in color, Thwing, 388.
Physical observatory, Washington, 78.
Pirsson, L. V., gmelinite, 57; mineralogical notes, 405; sulphur, orpiment and realgar in the Yellowstone, 401.
Polar light and cosmic dust, Liveing and Dewar, 69.
Pumpelly, R., secular rock-disintegration as related to transitional crystalline schists, 346.

R

Ramsay, W., System of inorganic chemistry, 510.
Richter, V. von, Chemistry of carbon compounds, 509.
Rotation, measurement of, Prytz, 341.
Russell, I. C., expedition to Mt. St. Elias, 1890, 171.

S

Salisbury, R. D., age of the orange sands, 252.
Schneider, E. A., constitution of certain micas, vermiculites and chlorites, 242.
Schott, C. A., magnetic declination in the United States, 178.
Scudder, S. H., Index to known fossil insects of the world, 516.
Sharpless, F. F., Michigan minerals, 499.
Sheldon, S., chapters on electricity, 511.
Silver, allotropic, Lea, 312.
Sinter, siliceous, gold-bearing, Weed, 166.
Smith, C. G., estimation of chlorates, 220.
Smyth, H. L., geology of Steep Rock Lake, Ontario, 317.
Specific heat determined by electric current, Pfaundler, 341.
Spectra, solar, photographic investigation, Hale, 160.
Spectrum of liquid oxygen, absorption, Olszewski, 338.
ultra-violet of the solar prominences, Hale, 160, 459.
Solar corona, Bigelow, 1.
prominences, photographic investigation of, Hale, 160, 459.
Solid and liquid, continuity of, Barus, 125.
Sound, intensity of, Wead, 21.
Stanley-Brown, J., bernardinite, a mineral or a fungus?, 46.
Stegosaurus, restoration of, Marsh, 179.
Stone, G. H., asphaltum of Utah and Colorado, 148.
Stones for building and decoration, Merrill, 516.

T

Telescopic work for starlight evenings, Denning, 178.
Texas, geol. survey, Dumble, 430.
Thorpe, T. E., Dictionary of applied chemistry, 341.
Thought transference, Lodge, 343.
Thwing, C. B., color photography by Lippman's process, 388.
Trowbridge, J., dampening of electric oscillations on iron wires, 223; physical abstracts, 69, 341, 426, 511.

U

Upham, W., exploration of the glacial Lake Agassiz in Manitoba, 429.

V

Vertebrate fossils, Marsh, 265, 336.
Volcanic action in the British Isles, history of, Geikie, 178.
Volcano Kilauea, Baker, 77.

W

Wadsworth, M. E., relations of the eastern sandstone of Keweenaw Point to the Lower Silurian limestone, 170; trap range of the Keweenawan series, 417.
Waggener, W. J., mercurial barometer, 387.
Walcott, C. D., fauna of the lower Cambrian, 345.
Walther, J., die Denudation in der Wüste, etc, 177.
Water, expansion of, Marek, 427.
of the salt lake of Oahu, 522.
Wave, explosive, in solid and liquid bodies, Berthelot, 66.
Wead, C. K, intensity of sound, 21.
Weed, W. H., gold-bearing hot spring deposit, 166; sulphur, orpiment and realgar in the Yellowstone, 401.
Wheeler, H. A., Missouri barite, 495.
Williams, G. H., anatase from Buckingham Co., Va., 431; greenstone schist areas of Michigan, 259.
Williams, J. F., newtonite and rectorite, 11.

Z

Zeiller, R., fossil flora of French Carboniferous, 75.